DATA EVALUATION RECORD
§ 72-1 -- ACUTE LC_{50} TEST WITH A COLDWATER FISH

1. **CHEMICAL:** Ethoxyquin **PC Code No.:** 055501

2. **TEST MATERIAL:** Ethoxyquin technical **Purity:** 99.1%

3. **CITATION:**

Authors:	K.R. Drottar and J.P. Swigert
Title:	Ethoxyquin: A 96-Hour Flow-Through Acute Toxicity Test with the Rainbow Trout (*Oncorhynchus mykiss*).
Study Completion Date:	April 4, 1996
Laboratory:	Wildlife International Ltd., Easton, MD
Sponsor:	Oregon, Washington, and California Pear Bureau, Portland, OR
Laboratory Report ID:	442A-101A
MRID No.:	439783-01
DP Barcode:	D225526

4. **REVIEWED BY:** Mark Mossler, M.S., Toxicologist,
KBN Engineering and Applied Sciences, Inc.,

Signature: [signature] **Date:** 7/5/96

APPROVED BY: Pim Kosalwat, Ph.D., Senior Scientist,
KBN Engineering and Applied Sciences, Inc.,

Signature: P. Kosalwat **Date:** 7/5/96

5. **APPROVED BY:**

Signature: [signature] **Date:** 9/19/96

6. **STUDY PARAMETERS:**

Age or Size of Test Organism:	38-46 mm
Definitive Test Duration:	96 hours
Study Method:	Flow-through
Type of Concentrations:	Mean measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements. The 96-hour LC_{50} for rainbow trout exposed to ethoxyquin technical was determined to be 18 ppm ai, which classifies this compound as slightly toxic to the rainbow trout.

Results Synopsis

LC_{50}: 18 ppm ai	95% C.I.: 14 - 23 ppm ai
NOEC: 3.5 ppm ai	Probit Slope: N/A

8. **ADEQUACY OF THE STUDY:**

A. Classification: Core

B. Rationale: N/A

C. Repairability: N/A

9. **GUIDELINE DEVIATIONS:**

1. The maximum concentration of solvent (0.3 mL/L) was greater than recommended (0.1 mL/L).

2. The pH of the dilution water (8.1-8.4) was greater than recommended (7.2-7.6).

10. **SUBMISSION PURPOSE:**

11. **MATERIALS AND METHODS:**

A. Test Organisms

Guideline Criteria	Reported Information
Species Preferred species is the rainbow trout (*Oncorhynchus mykiss*)	*Oncorhynchus mykiss*
Mean Weight 0.5-5 g	1.4 g
Mean Standard Length Longest not > 2x shortest	Mean: 42 mm Range: 38-46 mm
Supplier	Troutlodge, Inc., Sumner, WA
All fish from same source?	Yes
All fish from the same year class?	Yes

B. Source/Acclimation

Guideline Criteria	Reported Information
Acclimation Period Minimum 14 days	Held under similar conditions to testing for 106 days

Guideline Criteria	Reported Information
Wild caught organisms were quarantined for 7 days?	N/A
Were there signs of disease or injury?	No signs of disease or stress
If treated for disease, was there no sign of the disease remaining during the 48 hours prior to testing?	N/A
Feeding No feeding during the study	Last fed 48 hours prior to testing
Pretest Mortality < 3% mortality 48 hours prior to testing	Not reported

C. **Test System**

Guideline Criteria	Reported Information
Source of dilution water Soft reconstituted water or water from a natural source, **not** dechlorinated tap water	Well water, filtered and aerated
Does water support test animals without observable signs of stress?	Yes
Water Temperature 12°C	12.0-12.3°C
pH Prefer 7.2 to 7.6	8.1-8.4
Dissolved Oxygen Static: ≥ 60% during 1st 48 hrs and ≥ 40% during 2nd 48 hrs, flow-through: ≥ 60%	75-90% of saturation during the test
Total Hardness Prefer 40 to 200 mg/L as $CaCO_3$	136 mg/L as $CaCO_3$

Guideline Criteria	Reported Information
Test Aquaria 1. Material: Glass or stainless steel 2. Size: Volume of 18.9 L (5 gal) or 30 x 60 x 30 cm 3. Fill volume: 15-30 L of solution	 Stainless steel 25-L 15 L
Type of Dilution System Must provide reproducible supply of toxicant	Continuous-flow diluter
Flow Rate Consistent flow rate of 5-10 vol/24 hours, meter systems calibrated before study and checked twice daily during test period	6 volume replacements every 24 hours
Biomass Loading Rate Static: ≤ 0.8 g/L at ≤ 17°C, ≤ 0.5 g/L at > 17°C; flow-through: ≤ 1 g/L/day	0.15 g/L/day
Photoperiod 16 hours light, 8 hours dark	16 hours light, 8 hours dark
Solvents Not to exceed 0.5 mL/L for static tests or 0.1 mL/L for flow-through tests	Solvent: methanol Maximum conc.: 0.3 mL/L

D. Test Design

Guideline Criteria	Reported Information
Range Finding Test If LC_{50} >100 mg/L with 30 fish, then no definitive test is required.	Yes, but results were not reported

Guideline Criteria	Reported Information
Nominal Concentrations of Definitive Test Control & 5 treatment levels; dosage should be 60% of the next highest concentration; concentrations should be in a geometric series	Control, solvent control, 1.9, 3.8, 7.5, 15, and 30 mg ai/L
Number of Test Organisms Minimum 10/level, may be divided among containers	20, 10 per replicate
Test organisms randomly or impartially assigned to test vessels?	Yes
Biological observations made every 24 hours?	Yes
Water Parameter Measurements 1. Temperature Measured constantly or, if water baths are used, every 6 hrs, may not vary > 1°C 2. DO and pH Measured at beginning of test and ever 48 h in the high, medium, and low doses and in the control	Temperature measured constantly in one negative control chamber and at test initiation and termination in each test chamber DO and pH measured daily in alternating chambers that contained live fish
Chemical Analysis Needed if solutions were aerated, if chemical was volatile, insoluble, or known to absorb, if precipitate formed, if containers were not steel or glass, or if flow-through system was used	Yes

12. REPORTED RESULTS:

A. General Results

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes

Guideline Criteria	Reported Information
Recovery of Chemical	77-95%
Control Mortality Not more than 10% control organisms may die or show abnormal behavior.	0% mortality in both dilution water and solvent control
Raw data included?	Yes
Signs of toxicity (if any) were described?	Yes, signs observed at the 3 highest concentrations

Mortality

Concentration (ppm ai)		Number of Fish	Cumulative Number Dead			
			Hour of Study			
Nominal	Mean Measured		24	48	72	96
Control	<0.02	20	0	0	0	0
Solvent Control	<0.02	20	0	0	0	0
1.9	1.8	20	0	0	0	0
3.8	3.5	20	0	0	0	0
7.5	7.0	20	0	0	0	0
15	14	20	0	0	0	0
30	23	20	20	20	20	20

Other Significant Results: Fish exposed at the three highest-concentration treatment levels demonstrated surfacing, lethargy, erratic swimming, and lying on the bottom.

B. Statistical Results

Method: Binomial method

96-hr LC_{50}: 18 ppm ai
Probit Slope: N/A
95% C.I.: 14 - 23 ppm ai
NOEC: 3.5 ppm ai

13. VERIFICATION OF STATISTICAL RESULTS

Parameter	Result
Binomial Test LC_{50} (C.I.)	18 (14 - 23) ppm ai
Moving Average Angle LC_{50} (95% C.I.)	N/A
Probit LC_{50} (95% C.I.)	N/A
Probit Slope	N/A
NOEC	3.5 ppm ai

14. REVIEWER'S COMMENTS: This study is scientifically sound, fulfills the guideline requirements, and can be classified as **Core.** The 96-hour LC_{50} for rainbow trout exposed to ethoxyquin technical was determined to be 18 ppm ai, which classifies this compound as slightly toxic to the rainbow trout. The NOEC was 3.5 ppm ai.